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ABSTRACT

The preservation methods used for paper collections in archives were studied through a survey of archives in the metropolitan Atlanta (Georgia) area. The preservation policy or program was studied, and the implications for conservators and preservation officers were noted. Twelve of 15 archives responded (response rate of 80 percent). Basic preservation methods were used in all of the archives, including boxing, encapsulating, and photocopying. Environmental care of paper artifacts was minimal. Six archives had disaster plans in place. Five archives had a written preservation policy, and four had comprehensive preservation programs with goals and objectives. Conservators and preservation officers had to play the role of advocate for preservation, although few actual conservators and preservation officers were employed. Most preservation activities were carried out by employees with other job titles. Nine tables present study findings. Three appendixes contain the two cover letters used, and the survey instrument. (Contains 24 references.) (SLD)

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THE PRESERVATION OF PAPER COLLECTIONS IN ARCHIVES

by

CYNTHIA ANN ADAMS

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in the College of Education
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Atlanta, Georgia

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ABSTRACT

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Purpose

The purpose of this study was to determine preservation methods for paper collections in archives, including the preservation policy/program and the implications for conservators/preservation officers.

Methods and Procedures

The 15 archives surveyed were those in the Metro Atlanta area and were selected from the Society of Georgia Archivists Membership Directory 1991. A questionnaire was designed to obtain data in paper preservation areas studied. Descriptive statistics were utilized.

Results

Twelve out of 15 archives responded to the questionnaire with a response rate of 80%. Basic preservation methods were utilized in all of the archives surveyed. Six archives had disaster plans in place. Five archives had a written preservation policy and 4 had comprehensive preservation programs with goals and objectives.

Conclusions

Metro Atlanta archives were concerned about paper preservation in that basic preservation methods were utilized, namely, those of boxing, encapsulating, and photocopying. Environmental care of paper artifacts

was minimal. Few preservation policies/comprehensive preservation programs with goals and objectives and disaster plans were in place. Implications for conservators/preservation officers with regard to their roles in paper preservation included that of paper preservation advocate. Few conservators/preservation officers were employed in Metro Atlanta archives. Paper preservation policies/procedures in Metro Atlanta archives were carried out by those with other job titles.

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CHAPTER ONE

INTRODUCTION

Overview

This research study will seek to address paper preservation methods in archives, notably those of digital technology for storage, reprography, environmental control, and deacidification as these methods are multifaceted. This study will also address the issues of a preservation policy/comprehensive preservation policy. A survey of Metro Atlanta archives will be conducted in order to ascertain preservation methods for paper artifacts that are being utilized. The existence of a written preservation policy/comprehensive preservation program will also be surveyed. These issues will be addressed in order to determine implications for archivists/preservation officers with regard to their roles in preserving their own paper collections and influencing paper preservation.

Archives maintain one-of-a-kind original documents and they must approach the preservation problem differently from libraries. Usually, there is little duplication of records among archives; therefore, they cannot benefit from inter-institutional cooperation preservation microfilming (Calmes, 1988). Archival preservation encompasses planning and implementing policies, procedures, and processes that together prevent further deterioration or renew the usability of selected materials. Archival preservation is the acquisition, organization, and distribution of resources (human, physical, monetary) to ensure adequate protection of historical information of enduring value for access by

present and future generations (Conway, 1990).

The primary reason for the deterioration of modern papers is that they are acidic. In order to increase the life of paper significantly, acid-free (permanent/durable) paper must be used. Acid-free paper is produced by only a handful of U. S. paper companies.

On October 12, 1990, President Bush signed PL 101-423 into law, making the official policy of the United States that federal records, books and publications of enduring value be produced on acid-free permanent papers. This law will "'result in a net reduction of costs for government in that these materials will not have to be deacidified,'" so stated Senator Clairborne Pell ("Acid-Free Becomes Law," 1991), who sponsored this particular bill.

The need for preservation is dependent upon the condition of the paper artifact, its intrinsic value and its expected usage. This indicates that paper preservation is a selective process and must be entrusted to those who have knowledge and expertise in paper preservation and conservation.

To prevent the loss of an original work and to insure that the intellectual heritage of the past remains continuously available for the use of present scholars and students, archivists must establish effective preservation programs (Williams, 1966). The archival community faces overwhelming challenges to develop affordable strategies to preserve the Past. Their efforts have been hampered by insufficient financial resources and inadequate facilities (Battin, 1990).

Little research has been done in the area of paper preservation in

archives. The last landmark work is Howard Lowell's Preservation Needs in State Archives, which was published in 1986. Lowell's findings include few preservation policy documents and manuals exist; few concrete actions are being taken to meet preservation needs on the mass scale that is required (NAGARA, 1988). This study will therefore contribute to the knowledge base of paper preservation in archives along with current practices being utilized and implications for conservators/preservation officers with regard to their roles in paper preservation.

Statement of problem

The primary purpose of this research study is to investigate methods of paper preservation in archives. Specifically, this study will seek to answer the following questions:

1. What are current methods for paper preservation being utilized by Metro Atlanta archives?

2. Do these archives have a written preservation policy/ comprehensive preservation program with goals and objectives?

3. What are implications for conservators/preservation officers with regard to their roles in paper preservation?

Significance of the Study

The data collected will indicate paper-preservation methods being utilized in Metro Atlanta archives. The data gathered will be used to determine implications for conservators/preservation officers with regard to their roles in paper preservation. As it is most important for each archives to have a preservation policy/preservation program in

place, data collected will indicate the existence of such a policy/program within each surveyed archives.

Anne R. Kenney (Kenney, 1990) indicates a need for research studies and publications in the area of archives preservation. She cites the last landmark work as Howard Lowell's Preservation in State Archives, which was published in 1986 (Curtin, 1990).

Definitions

The following definitions will clarify terms used in this research study:

1. preservation - refers to all activities associated with maintaining materials in their original form or some other format (Kenney, 1990).

2. conservation - refers to all physical and chemical treatments associated with maintaining materials in their original form or some other format (Kenney, 1990).

3. permanent/durable paper - a connotation for machine-made paper. "Permanent" denotes the property of the paper to retain its original characteristics. "Durable" means resistance to deterioration by use (Cunha, 1971).

CHAPTER TWO

REVIEW OF SELECTED LITERATURE

Methods of paper preservation in archives include storage methods: boxes, mylar encapsulation, optional disk; reprography methods: microfilming and photocopying; laboratory conservation treatment methods: tape removal, mending, cleaning, strengthening, deacidification, and other chemical processes; and environmental control of storage areas. The need for preservation depends upon the condition of the paper artifact, its intrinsic value and its expected usage.

The review of the literature relating to methods of archival paper preservation included descriptions and studies in the areas of storage: boxes and optional disk; reprography: microfilming and photocopying; treatment: deacidification; and environmental control. Literature was also reviewed to ascertain the significance of a written preservation policy.

Methods of storage

The National Academy of Sciences, Committee on the Preservation of Historical Records, found that the vast majority of the U. S. National Archives holdings had been housed in file boxes rather than in bound volumes, that the paper records within boxes were in better condition than the paper records in bound volumes, and that bound materials typically showed evidence of deterioration and aging that progressed into the volume from the outer edges of the paper exposed to an uncontrolled environment. The Academy found that storage boxes appeared to protect records by damping temperature and humidity fluctuation and

blocking pollutant intrusion. The Academy also found that the rate of deterioration of paper stored within a controlled environment was slowed considerably (Calmes, Schofer & Eberhardt, 1988).

"Holdings maintenance" was a term used to describe storage enhancement of archival material that slowed the rate of deterioration. Good storage techniques included the use of acid-free boxes, file folders, polyester sleeves, and flat, unfolded paper artifacts. Holdings maintenance, a major element of the 20-year preservation plan of the National Archives, continued to serve as the focal point for preservation initiatives for holdings maintenance actions were designed to eliminate the need for conservation treatment ("Preservation Activities at the National Archives, Fy 1990," 1991).

Digital imaging, where books are scanned into computer storage, was a promising alternative process for storage. The images could be displayed or printed. Digital imaging permitted considerable reprocessing: adjustment of contrast, removal of stains, adjustment of image size. Imaging technology should be within the reach of most archives within a decade (DePew, 1991).

Digital imaging permitted the preservation of the original book in its exact format and appearance. A normal book could be scanned for 13 to 28 cents a page, compared to filming for 10 to 15 cents a page. A CD-ROM stores a little over 0.5 gigabytes; therefore, a CD could hold from 3 to 15 books. The disadvantages of this technology were that the text could not be searched for specific information and the shelf life

microfilm (DePew, 1991). Because of the high mastering cost, the CD-ROM was not a practical storage medium for information when only a few copies were needed (Library Study Committee, 1987).

Digital conversion required special equipment and software programs that rapidly became obsolete. There were two types of digital conversion, ASCII (non-image) and digital imagery. The non-image technology did not store graphic material; therefore, the words were preserved, but not their exact format and appearance. With an ASCII file, it was possible to search for names, terms, subjects, phrases with suitable software. Files that were created in the 1990s could be unreadable in the 2010s; this technology did permit access to computer-based files (a major disadvantage of other systems). This technology was improving very quickly (DePew, 1991).

Reprography

The word reprography referred to facsimile reproduction. As handling shortened the life of paper, the best way to prevent the destruction of heavily used paper artifacts was to copy the information onto microfilm or onto another piece of paper using an electrostatic copier. By providing a research copy, the original was allowed to remain in storage.

Two types of reprography investigated were microfilming and photocopying. Microfilm must conform to archival quality standards. A recent cost/benefit study of preservation alternatives for U. S. federal pension files revealed that microfilming could reduce storage requirements and labor costs of providing reference service; however,

the extremely high cost of converting files to microfilm would cancel the savings in space and operating (Calmes, et al., 1988). Reprographic copies were slightly more difficult to read (Kormendy, 1989).

Mimeograph papers and Thermo-fax copies should be microfilmed as early as possible. These reproductions of the 1940s, 1950s, and 1960s were deteriorating rapidly; the contrast between the printed images and the paper was diminishing (Calmes et al., 1988).

Production of microfilms was time-consuming and required trained staff and expensive equipment. Before the titles were reproduced or filmed, titles should have been searched for through other archives or commercial publishers (DePew, 1991).

Many archival materials should not be deacidified or strengthened because of their fragile condition; they should be converted to another medium instead in order to preserve their information. Microfilm was traditionally used for serial publications and microfiche for monographs, reports, and pamphlets (DePew, 1991). Microforms could be produced in-house or contracted out to microform companies or service bureaus.

Two systems of photocopying were used to reproduce materials for patrons and to reduce wear and tear on originals: the electrostatic process, i.e., xerography, was a general term applied to copies produced directly on paper. Photocopy was limited to items for which a hard copy was preferred, instead of a microfilm. This process did not work well for oversize materials, color, newspapers or items that were heavily illustrated with halftones. There were no national standards for

photocopying: each archive must write its own guidelines. The Research Libraries Group, Inc., provided guidelines for producing usable products and the Association for Library Collections & Technical Services, a division of ALA, published Guidelines for Preservation Photocopying of Replacement Pages in 1960. This pamphlet could be obtained without charge from ALCTS.

A Photostatic copy was a right-reading, negative paper photocopy. Because of the expense involved in the equipment and photographic paper, the only single documents of high research value that had poor image quality and could not be reproduced satisfactorily by photocopying were copied. A Photostatic system produced high-quality, large-size prints and was useful in reproducing maps and newspaper pages: this process reduced/enlarged up to 50 percent of its linear dimensions (DePew, 1991).

Deacidification

Deacidification processes were developed to neutralize acids that cause paper to deteriorate and to deposit an alkaline reserve to produce a permanent paper. These processes were developed for materials that had not become brittle. The objective was to extend the life of the paper; the treatment would not restore the paper to its original state nor reverse previous damage. Most white papers can be deacidified.

Deacidification was originally developed by the late William J. Barrow in the 1950s and 1960s. Barrow developed an aqueous deacidification process. Each sheet of paper was individually immersed in the deacidifying solution and then air dried. Barrow also developed

a spray method for stabilizing book and writing papers (Permanence/Durability, 1963).

Another deacidification process was a nonaqueous method which employed a bath or spray. Sheets of paper were dipped in liquid or sprayed with a solution. Entire books were sprayed with the solution, page by page, without being disbound.

Nonaqueous deacidification (Wei T'O Process) was invented by Richard Daniel Smith. Nonaqueous deacidification treatment was used to improve the stability of acidic paper as efficiently, if not more efficiently than aqueous deacidification processes (Smith, 1970). Wei T'O solutions were available at Wei T'O distributors and Wei T'O Associates. Wei T'O solutions were applied by brushing, dipping, or spraying, using Wei T'O equipment. This process prevented additional acid attack, protected against oxidation, sanitized the paper and prevented brown stains by fungal attack (foxing). All Wei T'O solutions were to be used in well-ventilated areas or with a fume hood. Technicians were to wear a respirator and goggles.

Aqueous deacidification, while safe for some materials, was capable of darkening, changing the color, roughening the surface of some papers and bleeding, fading or changing the color of some inks, dyes and paints. For these reasons, testing was important of an image prior to immersion.

Another method of deacidification was vapor phase. This process used a dry, volatile, gaseous, alkali that vaporized to penetrate the

material being treated. Chemicals were placed in interleaving envelopes. The envelopes were placed in about every 100 pages in the books to be deacidified. The gas neutralized the acid in books and boxed documents. It was claimed that the paper after treatment became immune to acid attack in polluted atmosphere, i.e., the paper was buffered; it must be stated that this particular claim was not substantiated in laboratory test (DePew, 1991).

Mass deacidification of books and papers was a practical way to deacidify millions of deteriorating materials. Wei T'O Associates also developed a mass deacidification system. There were several other systems for mass deacidification, one of which was the diethyl zinc (DEZ) system originally under development by the Library of Congress. DEZ was a hazardous substance and a major drawback to the LC process (Dess, 1989). DEZ ignites spontaneously on exposure to air, posing risks of fire/explosion.

The Library of Congress began developing the DEZ process in the 1970s in an attempt to solve its overwhelming deacidification problem. Diethyl zinc gas permeated paper in a vacuum chamber in a process that required 50 to 55 hours and consisted of three phases. The Library of Congress believed that the DEZ process would meet its particular needs better than any other process. The Library of Congress' goal was to deacidify one million books annually over a period of 20 years. A plant for treatment was to be operational in 1993.

The Wei T'O process created some feathering of alcohol-soluble inks and smudged some colors in book illustrations. For these reasons,

books were to be preselected for their suitability for treatment. The Wei T'O solvents cleaned book paper during the deacidification process, but detrimentally affected the paper sizing, increasing the wetability of the book pages. The cost was estimated to be about $3.95 to $6.50 (1988) per book; after neutralization was completed, the pH of the book paper was from 8.5 to 9.5 (DePew, 1991).

Other mass deacidification systems included the Bookkeeper process, which could be used as an in-house option because of the simple equipment, relatively low capital cost, and lack of hazards. Books were to be preselected. The cost was estimated to be about $4.00 to $6.00 (1988) per book. The surface pH of the book paper was 8.0 to 9.0 after treatment. Its reliance upon fluorocarbons as carriers of the neutralizing agent made it vulnerable as a system to regulatory complexities.

Book Preservation Associates' process for mass deacidification stabilized books as well as deacidified them. Treatment raised the pH to a range of 7.0 to 9.0 and treatment cost was $3.00 to $5.00 (1988). No preselection was required except to sort out old leather-bound volumes.

The Lithco process strengthened paper by a factor of 10 to 12; cost was estimated to be from $5.00 to $8.00 (1988). The pH was raised by about 7 to 9 percent (DePew, 1991).

Environmental control

The Public Archives of Canada study concluded that environmentally controlled storage was the most economical preventive preservation

measure archives could take (NAGARA, 1988). Paper artifacts were to be stored in fire-protected, secure, darkrooms which had controlled atmospheric environments. Constant clear, cool and dry air should be provided. Temperature was to be maintained between 68-72F and 40-50% relative humidity. Monitoring devices, such as the hygrothermograph, especially for relative humidity, were important. Despite the hazard of wetting artifacts, water sprinklers were to be a requirement in all paper artifacts storage areas. Paper was to be rescued from water by drying techniques. Burned paper could not be restored. In urban areas, air was to be filtered through a chemical bed, such as activated carbon, to remove sulfur dioxide, oxides of nitrogen, and ozone (Calmes et al., 1988).

The best strategy for the preservation of collections in archives was controlling the environment and conditions under which the objects were stored, displayed or shipped (Preusser & Druzik, 1989).

At the California Institute of Technology, the chemistry of ozone attack on colorants was studied and it was confirmed that ozone caused fading. In two other parallel studies, work continued on the integration between inorganic acidic gases and paper (Preusser & Druzik, 1989).

There has never been agreement on the use of sprinkler systems for the suppression of fires in archives (Cunha, 1990). In the past, managers were more concerned about water damage than fire damage. The use of Halon Systems in buildings where there was good

compartmentalization was effective, but the systems were expensive; replenishment costs could be high if there were an accidental discharge of the gas. Halons were chlorofluorocarbons, and there was international agreement on the need to discontinue the manufacture of hard CFCS because of their destruction of the ozone layer surrounding the earth. Another fire suppression system was the carbon dioxide system.

Laboratory conservation treatment

It was demonstrated that Parylene was useful for strengthening paper. Union Carbide was licensed to market the Wei T'O process and chemicals, and it was likely that Union Carbide would try to find a way to combine the Wei T'O deacidification process and the Parylene process to produce a strong alkaline paper (Cunha, 1990).

"Laboratory conservation treatment" was a term used to describe a variety of actions performed on archival materials in a laboratory setting where special equipment and skills were needed. Treatment consisted of tape removal, mending, strengthening, cleaning, deacidification and other chemical processes (Calmes, et al., 1988).

Research in environmental control

In 1988 and 1989, Paul Conway conducted the first nationwide study of archival preservation practices in the United States, surveying 400 archives. Fifty-six percent (179) of the survey respondents claimed to have controlled temperatures, while 44 percent (141) claimed to be able to control relative humidity in the storage areas. Twenty-seven percent (86) of the respondents reported having at least one recording hygrothermograph in the storage area (Conway, 1990).

Ten percent (32) of all respondents could be violating fire codes by having neither fire and smoke detection equipment in the stacks, nor any capacity to put out fires that could start. Fifty-two percent (166) had fire and smoke detection equipment in place and fire extinguishers in the storage areas, but did not necessarily have the capacity to suppress fires after hours. The remaining 38 percent (162) of archival units had detection equipment in place and the capacity to suppress fires at any time, either by wet-dry sprinklers, halon gas or carbon dioxide gas. Fifty-six percent (179) of the survey respondents claimed to have a disaster plan in place or in the planning stages (Conway, 1990).

As a group, Federal, state and museum archives appeared to have accomplished the most in providing minimal level environmental care for their collections. Academic archives were found to offer more treatment actions, i.e., mending, cleaning (Conway, 1990).

NAGARA'S study of State archives revealed that 30 State archives had fire detection systems; 17 had fire suppression systems; only 22 had temperature controls, and 17 had relative humidity controls; 9 had environmental controls which functioned properly (NAGARA, 1988).

Donald B. McKeon in a Delphi Study (1980-1981) predicted that within the next two decades, archives conservation would be characterized by greater use of outside centers to treat materials (McKeon, 1984).

Disaster plan

Disaster prevention and preparedness were a part of conservation

concern. After the Florence flood in 1966, archivists realized that an organized approach to disaster prevention and action would save more materials than a haphazard one. The awareness stimulated by well-publicized disasters resulted in the development of prevention and preparedness plans and in better techniques for coping responsibly with disasters (Buchanan, 1981).

Disaster action included assessment, protection, decision and choice of alternatives, supervised execution, on-going evaluation and change and an analysis of the project with modifications needed for the disaster plan (Buchanan, 1981).

An intelligent assessment of potential problems could serve as a preventive measure. The disaster prevention plan published by Hilda Bohem's committee for the University of California system and the one published by Cornell University were examples of preventive hazard surveys (Buchanan, 1981).

NAGARA'S study of State archives revealed that only 16 had disaster plans (NAGARA, 1988).

Significance of a written preservation policy

Since the frequency of handling materials was a key determinant in the longevity of paper, an effective preservation plan should rely on day-to-day reference and rehousing activities to identify papers in need of preservation (Calmes et al., 1988).

Written into a preservation plan should be a holdings maintenance plan. Holdings maintenance should be performed at the time of accession

in order to preclude any buildup of preservation backlog.

Priorities should be written into a preservation policy, indicating those paper artifacts considered to be the most valuable and the most frequently referenced; these materials should receive priority laboratory treatment. Those artifacts subjected to damage in use should be protected at the time of use. The most rapidly deteriorating groups of artifacts should be scheduled for immediate recopying for preservation of the information contained(Calmes et al., 1988).

In Howard Lowell's Preservation Needs in State Archives, which was published in 1986, it was indicted that only 9 out of 45 archives had any kind of policy statement relating directly to preservation. Only one archives had developed a comprehensive preservation plan (Curtin, 1990). NAGARA GRASP (The National Association of Government Archives Guide and Resources for Archives Strategic Preservation Planning) was the first publication geared for archivists to use in developing comprehensive preservation programs. A self-study was included which would assist archivists in improving preservation goals.

Implications for conservators/preservation officers

Because preservation was a significant part of every archivist's job, archival training was to include emphasis on general preservation principles (Kaplan & Banks, 1990). Archives needed to evaluate which type of preservation personnel would meet their institutional needs, whether a conservator or a preservation administrator. Few archives were capable of employing both a conservator and an administrative officer. Experienced archival administrators could also function as

preservation administrators, provided they had knowledge of preservation practices and were able to implement such practices. Archivists and conservators must explore creative new strategies to communicate preservation needs to educators, resource allocators and the general public to ensure continued support and cooperation for the "long-term preservation of our documentary heritage" (Kaplan & Banks, 1990).

As conservators were trained to work independently, frequently in isolation, a greater interaction of conservators with allied professionals could establish partnerships in the work place (Kaplan & Banks, 1990).

It was important that staff kept current with the technical literature and attended professional conferences since preservation and conservation were rapidly changing fields (Jones & Ritzenthaler, 1988).

Research indicated (Conway, 1990) that coordination of preservation efforts with other archival repositories was vital to the survival of archival materials. It was the professional responsibility of conservators to promote preservation programs in practical terms.

Summary

The current philosophy of paper conservators is that the less done to paper artifacts the better, and that whatever is done should be reversible (Calmes et al. 1988, p. 108).

As few research studies had been done in the areas of paper preservation in archives, the literature called for additional and continuous research. The literature indicted that archivists were

developing an awareness of their responsibilities as conservators/preservationists through research, surveys, and education.

Because of exorbitant costs, cooperative paper projects were suggested in the areas of reprography, deacidification and laboratory treatment. Outside treatment centers were suggested as a result of McKeon's research study.

Research studies indicated that few preservation policies or disaster plans were in place in archives, and that environmental care of paper collections was minimal.

Preventive measures such as holdings maintenance actions and constructing environmentally controlled storage areas were suggested to retard or eliminate the need for conservation treatment. As T. R. Schellenberg pointed out in Modern Archives, Principles and Techniques: "The end of all archival effort is to preserve valuable records and make them available for use" (Gertz,1990). Preservation was preventive medicine, often rendering specialized expensive conservation treatments unnecessary by identifying problems before they became more serious and taking cost-effective remedial actions (Conway, 1990).

CHAPTER THREE

RESEARCH METHODOLOGY AND PROCEDURES

The research design of this study was one of a descriptive survey methodology. Fifteen Metro Atlanta area conservators/preservation officers of archives were surveyed in order to determine the existence of a written preservation policy/preservation program, to determine the existence of a disaster plan, to determine methods of paper preservation being utilized and to determine implications for conservators/preservation officers as to their roles as paper conservators/preservationists.

Population

Those thought to be in a policy making position with regard to conservation/preservation methods in archives were selected from the Society of Georgia Archivists Membership Directory 1991, the organization's latest membership directory. A purposive method of sampling was used in selection of this sample from the Metro Atlanta area. The sample surveyed included various types of archives: 2 local, 5 academic, 2 Federal, 1 state, 1 corporate, 2 special, 1 religious and 1 museum.

Instrumentation

A survey addressing two research areas was developed. Its parts consisted of the roles of conservators/preservation officers in paper preservation and preservation methods utilized; the issues of a written preservation policy/program's existence and a disaster plan's existence were included in the survey.

The following categories of questions used in the survey were taken from a questionnaire prepared by the Society of American Archivists with the Assistance of the National Endowment for the Humanities. This questionnaire was a part of the nationwide study of archival preservation practices (Conway, 1990). The categories were the following: environmental care and types of archives. The categories within the treatment question were taken from an article entitled "Theory and Practice of Paper Preservation for Archives" (Calmes, 1988).

Questions 1 through 5 of the survey addressed the roles of conservators/preservation officers as paper preservation advocates, policy makers. Questions 6 through 15 addressed methods of preservation utilized. As preservationist/conservator titles differed among archivist personnel, and as numerous archives did not employ a conservator/preservation officer, question 16 established the title of the individual completing the survey. Question 17 called for a type response. If codings were misplaced, the researcher would have data indicating the type of archives surveyed and data was analyzed with regard to types of archives within the question category preservation methods utilized.

The survey was validated by input from GSU class colleagues and by a field test of the survey: three conservators/preservation officers were surveyed. Two of these surveys were used in the final data analysis.

A field test of the survey instrument was mailed after December 1, 1992. These surveys were to be returned by December 12, 1992. One

survey out of three was returned by December 12. A follow up postcard was sent to the two non-respondents. After a reevaluation of the survey and a conversation with a conservator, the survey instrument was mailed to the surveyees after January 4, requesting that the survey be returned by January 16, 1993. Mail/phone follow ups were made to non-respondents. Each survey was coded numerically in order to insure a tracking of respondents. Another conservator/preservation officer was purposively selected when an envelope was returned marked "Addressee unknown".

Data Analysis

Results of the survey were compiled in table format, using frequency data: preservation methods utilized in Metro Atlanta area archives, including environmental care components found in Metro Atlanta archives and the existence of a written preservation policy/comprehensive preservation program with goals and objectives. Textual presentation was also used with regard to results of the survey: implications for conservators/preservation officers in their roles as paper conservators/preservation officers. Descriptive statistics were utilized.

CHAPTER FOUR

RESULTS OF THE STUDY

Introduction

The purpose of this research study was to determine methods of preserving paper collections in archives, specifically in the Metro Atlanta area. Research was also conducted to determine the existence of preservation policies/comprehensive preservation programs in Metro Atlanta archives and to determine implications for those in charge of preservation programs/procedures in those archives.

Population/Demographics

A questionnaire was mailed to 15 individuals who were in charge of preservation policies/procedures in Metro Atlanta archives. The names of those individuals were taken from the Society of Georgia Archivists Membership Directory 1991, the organization's latest membership directory. Twelve individuals responded, three responding after a follow up postcard and a phone call, for an overall response rate of 80%.

Table 1 shows the number of types of archives surveyed along with the number of returned surveys.

Table 1

Types of Archives Surveyed	Number Surveyed	Number of Surveys Returned
Local	2	1
Academic	5	4
Federal	2	2
State	1	1
Corporate	1	1
Special	2	1
Religious	1	1
Museum	1	1
Total:	15	12

As titles of those in charge of preservation programs/procedures differed among archives, the researcher asked the individual completing the survey to identify his/her title. This data was analyzed with regard to the employment in Metro Atlanta archives of those specializing in the area of preservation: only two of those surveyed held the title of conservator/preservation officer. Table 2 reveals the specific titles of those completing the survey, those who are responsible for preservation programs in Metro Atlanta archives.

Table 2

Titles of Those Responsible for Preservation Programs in Archives Surveyed

Type of Archives	Director	Asst. Director	Archivist	Conservator	Preservation Officer	Registrar
Local n = 1	1					
Academic n = 4	1		2		1	
Federal n = 2	1		1			
State n = 1				1		
Corporate n = 1			1			
Special n = 1			1			
Religious n = 1		1				
Museum n = 1						1
Total n = 12	3	1	5	1	1	1

Research Question 1

What are current methods for paper preservation being utilized by Metro Atlanta archives? Survey Questions 6, 7, 8, 9, 10, 11, 12, 13, 14 and 15 relate to Research Question 1.

It was found that 5 archives have an in-house microfilm facility: 2 Federal, 1 state, 1 special and 1 religious. Three archives have an in-house preservation facility: 2 academic, 1 state. A state archives has an in-house bindery.

The survey asked for specific preservation treatments with regard to types of paper artifacts. The most frequently utilized preservation treatment for a paper copy not in a container was placing the artifact in a box (9), (see Table 3).

Preservation treatments most frequently utilized for impermanent paper copies included placing the copy in a box (3), and photocopying (3) (see Table 4).

Treatment of a random single impermanent sheet included placing the artifact in a box (4), mylar encapsulating (3), photocopying (5) and lab treating in-house (1) (see Table 5).

The data indicated that frequently used and valuable copies were treated as follows: artifact placed in box (4), mylar encapsulated (4), microfilmed (3), and photocopied (6) (see Table 6).

Treatment of a random single damaged sheet included placing the sheet in a box (5), Mylar encapsulating (5), photocopying (6) and lab treating in-house (2) (see Table 7).

Table 3

Methods of Preservation Used for Specific Categories of Paper: Paper copy Not in a Container

Type of Archives	Box	Mylar Encapsulate	Microfilm	Photocopy	Lab Treat In-House	Store Using Optical Disk	Other	Methods Not Indicated
Local n = 1	1							
Academic n = 3	3				1		Folder/ Enclosure 1	1
Federal n = 2	2							
State n = 0								1
Corporate n = 0								1
Special n = 1	1	1						
Religious n = 1	1		1					
Museum n = 1	1							
Total n = 9	9	1	1	1			1	3

Note. Respondents were allowed more than one response.

Table 4

Methods of Preservation Used for Specific Categories of Paper: All Impermanent Copies

Type of Archives	Box	Mylar Encapsulate	Microfilm	Photocopy	Lab Treat In-House	Store Using Optical Disk	Methods Not Indicated
Local n = 0							1
Academic n = 3	2	1	1	1			1
Federal n = 1	1			1			1
State n = 0							1
Corporate n = 1				1			
Special n = 0							1
Religious n = 1			1				
Museum n = 0							1
Total n = 6	3	1	2	3			6

Note. Respondents were allowed more than one response.

Table 5

Methods of Preservation Used for Specific Categories of Paper: Random Single Impermanent Sheet

Type of Archives	Box	Mylar Encapsulate	Microfilm	Photocopy	Lab Treat In-House	Store Using Optical Disk	Methods Not Indicated
Local n = 0							1
Academic n = 4	2	2		3	1		
Federal n = 1	1			1			1
State n = 0							1
Corporate n = 1				1			
Special n = 1	1						
Religious n = 1		1					
Museum n = 0							1
Total n = 8	4	3		5	1		4

Note. Respondents were allowed more than one response.

Table 6

Methods of Preservation Used for Specific Categories of Paper: Frequently Used and Valuable Copies

Type of Archives	Box	Mylar Encapsulate	Microfilm	Photocopy	Lab Treat In-House	Store Using Optical Disk	Methods Not Indicated
Local n = 1			1				
Academic n = 4	2	2		3			
Federal n = 2	1	1	1	1			
State n = 0							1
Corporate n = 1				1			
Special n = 1				1			
Religious n = 1		1	1				
Museum n = 1	1						
Total n = 11	4	4	3	6			1

Note. Respondents were allowed more than one response.

Table 7

Methods of Preservation Used for Specific Categories of Paper: Random Single Damaged Sheet

Type of Archives	Box	Mylar Encapsulate	Microfilm	Photocopy	Lab Treat In-House	Store Using Optical Disk	Methods Not Indicated
Local n = 0							1
Academic n = 4	2	2		4	2		
Federal n = 2	1	1		1			
State n = 0							1
Corporate n = 1		1		1			
Special n = 1	1						
Religious n = 1		1					
Museum n = 1	1						
Total n = 10	5	5		6	2		2

Note. Respondents were allowed more than one response.

Survey Questions 8-12 dealt with deacidification. Only one deacidified single items. There was no response to the follow-up question concerning the method of deacidification used in this particular instance.

None of the archives surveyed had participated in mass deacidification projects.

It was found that 4 archives had participated in paper preservation projects with other archives: 2 academic, 1 Federal and 1 state. Academic archives projects included RLG microfilming projects and ASERL/SOLINET Brittle Books Microfilming Project. Federal included participation in preservation studies in conjunction with the Library of Congress. State indicated participation in projects over the years: "Difficult to list specific projects."

Twelve surveyed archives indicated a number of environmental care components (see Table 8). It was found that almost all of the surveyed archives had basic environmental care components. Only 1 archives had halon gas in the storage areas as a fire suppressor and 1 archives had carbon dioxide gas in storage areas as a fire suppressor. Six archives (1 Local, 1 Academic, 2 Federal, 1 State, 1 Museum) had disaster plans.

Table 8

Environmental Components of Archives

Type of Archives	Humidity Controlled Storage Areas	Temperature Controlled Storage Areas	Monitoring Equipment For Humidity & Temperature	Fire Extinguishers In Storage Areas	Sprinklers In Storage Areas	Halon Gas In Storage Areas	Carbon-Dioxide Gas In Storage Areas	Disaster Plan
Local n = 1	1	1	1	1				1
Academic n = 4	2	2	3	3	1	1	1	1
Federal n = 2	2	2	2	2	2			2
State n = 1	1	1	1	1				1
Corporate n = 1	1	1		1	1			
Special n = 1		1		1				
Religious n = 1	1	1	1	1				
Museum n = 1	1	1	1		1			1
Total n = 12	9	10	9	10	5	1	1	6

Research Question 2

Do these archives have a written preservation policy/comprehensive preservation program? Survey questions 4 and 5 ask about the existence of these policies. Of 11 responses, 5 archives indicated the existence of a preservation policy. Of 11 responses, 4 archives indicated the existence of a written comprehensive preservation program with goals and objectives (see Table 9). One academic archives indicated that a comprehensive program was currently being developed.

Table 9

The Existence of a Written Preservation Policy/Comprehensive Preservation Program with Goals and Objectives

Type of Archives	Written Preservation Policy		Comprehensive Preservation Program with Goals and Objectives	
	Yes	No	Yes	No
Local n = 1		1	1	
Academic n = 4	1	3		4
Federal n = 2	2		2	
State n = 0				
Corporate n = 1		1		1
Special n = 1	1			1
Religious n = 1		1		1
Museum n = 1	1		1	
Total n = 11	5	6	4	7

Research Question 3

What are implications for conservators/preservation officers with regard to their roles in paper preservation? Survey Questions 1-3 relate to the topic of implications for conservators/preservation officers. When asked why archivists have been slow in responding to the issue of paper preservation, respondents indicated a lack of funds (11), other priorities, e.g., providing access (7), don't know (1) and other reasons (3). Other reasons included "have not been empowered to make the decisions," and "lack of expertise in technical areas, e.g., deacidification, etc. and fear of damaging materials."

When asked which are the most effective means by which archivists may influence acid-free paper production, respondents replied supporting lobbying efforts by professional archivists organizations (9), meeting with publishers to urge the use of acid-free paper for publishing (3), meeting with paper company representatives to urge acid-free paper production (1), and other reasons (2). Other reasons included "local efforts with government agencies, academic faculty, etc.," and "buying the products of companies that use alkaline paper and letting other companies know that you do this."

When asked how may archivists influence paper preservation in their own facility, respondents indicated updating one's knowledge of paper preservation through professional journals, workshops (1), supporting industry practices which facilitate on-site paper preservation treatment (5), supporting budgetary practices which facilitate paper preservation outside one's own facility (3) and other

reasons (3). Other reasons included "supporting preventive preservation measures, e.g., good housing, storage," "be active on records management," and "preventive activities: care and handling, environmental control." Twelve responses were tabulated.

CHAPTER FIVE

DISCUSSION AND CONCLUSIONS

Findings

The most frequently used preservation methods for paper collections in Metro Atlanta archives included placing paper artifacts in a box, folder/enclosure, photocopying, mylar encapsulating and microfilming. Few in-house treatments were rendered other than removing staples or tape and mending. Optical disk storage was not a storage method used by Metro Atlanta archives. Metro Atlanta archives did not deacidify paper artifacts in-house, except for one Federal archives and had not participated in mass deacidification projects.

Metro Atlanta archives were concerned about environmental care components. It was found that most archives had humidity and controlled temperature storage areas and monitoring equipment for both humidity and temperature. Fire extinguishers were also present in most of the archives. Few sprinklers were in place. Few had fire suppressants such as halon gas and carbon dioxide gas in storage areas. Only half of the archives had disaster plans.

Fewer than half the archives had a written preservation policy and fewer still had a comprehensive preservation program with goals and objectives.

A lack of funds was a primary reason for archivists' slowness in responding to the issue of paper preservation and a secondary reason was other priorities, e.g., providing access.

The most effective means by which archivists may influence acid-free paper production were supporting lobbying efforts by professional archivists organizations and meeting with publishers to urge the use of acid-free paper for publishing.

Most archivists could best influence paper preservation in their own facility by supporting industry practices which facilitate on-site paper preservation treatment. Archivists may influence paper preservation in their own facilities by updating one's knowledge of paper preservation through professional journals, workshops and by supporting budgetary practices which facilitate paper preservation outside one's own facility, indicating a need for regional centers for treatment of paper artifacts.

Discussion

There were few conservators/preservation officers in Metro Atlanta archives. In fact, one conservator and one preservation officer were employed among the archives in the study. Those in charge of the preservation of paper artifacts included archivists, directors, an assistant director and a registrar.

Academic and Federal archives were more active in preservation methods than other types of archives because of budgetary practices allocating monies for the preservation of paper artifacts and because of the availability of in-house preservation expertise. Conway (1990) found that as a group, Federal, state and museum archives accomplished the most in providing minimal level environmental care for their collections.

Lowell found in his Preservation Needs in State Archives (1986), that few archives had any kind of policy statement relating directly to preservation. NAGARA's study of state archives (1988) revealed that only 16 out of 50 had disaster plans. Only 6 Metro Atlanta archives out of 12 had disaster plans. Five Metro Atlanta archives indicated the existence of a preservation policy; only 4 indicated the existence of a written comprehensive preservation program with goals and objectives. One academic archives indicated that a comprehensive program was currently being developed.

Implications for conservators/preservation officers with regard to their roles in paper preservation included the role of advocate for the preservation of paper collections. The most effective means of advocacy/influencing acid-free paper production was by supporting lobbying efforts by professional archivists organizations. Other reasons included buying the products of companies that use alkaline paper and by letting other companies know that one does this; another reason included local efforts with government agencies and academic faculty.

The literature (McKeon, 1984) indicated that archivists had been slow in responding to the issue of paper preservation because of a lack of funds and because of other priorities, e.g., providing access. This study corroborated these facts, indicating that archivists had not been empowered to make decisions concerning paper preservation and that they lacked expertise in the technical areas of paper preservation. Archivists could influence paper preservation in their own facility by

supporting industry practices which facilitate on-site preservation treatment and by updating their own knowledge of paper preservation through professional journals and workshops.

Conservators/preservation officers/archivists must assume leadership roles in the area of paper preservation to insure the survival of paper artifacts. Those in charge of paper preservation policies must enlist the assistance of each archival employee to educate patrons, to attain knowledge of paper preservation methods and to utilize these preservation methods, namely preventive preservation methods.

"It is impossible to make responsible preservation decisions without coordinating preservation efforts with other archival repositories" (Conway, 1990). Donald McKeon's study indicated that cooperative efforts must be coordinated by establishing outside centers for preservation treatment (McKeon, 1984). This study found that few in-house treatments were utilized. Perhaps, regional centers are needed for the treatment of paper artifacts.

Few cooperative paper preservation projects had been undertaken by Metro Atlanta archives. As funds are few and priorities are many, cooperative paper preservation projects offer a solution for the treatment of a large number of artifacts. Conservators/preservation officers/archivists must not seek an environment of isolation but rather must share knowledge and work in cooperation with their archival colleagues to preserve the heritage of a nation.

A delimitation of this study was the surveying of only Metro

Atlanta archives. As few or no complete directory listings of archives were available and as time was limited with regard to the completion of the research study, the researcher chose to survey only Metro Atlanta archives. Conway (1990) found no adequate listing of archival repositories and therefore had to center his research on a more limited study population.

As the preservation of our written heritage is dependent upon paper preservation methods utilized, including the existence of a viable written preservation policy/comprehensive program with goals and objectives, further studies should be conducted within the archives of the Southeast. A follow up study of preservation methods for paper collections in Metro Atlanta archives should be conducted within a five year period in order to determine the status of preventive preservation methods utilized and the status of preservation policies/comprehensive preservation programs with goals and objectives. Does the data indicate an increased awareness of preventive preservation methods and an increase in the number of preservation policies/comprehensive preservation programs?

Specific questions that should be asked are as follows:

1. Why are there not more conservators/preservation officers employed in archives?

2. What kind of specialized training is available for those interested in paper preservation?

3. How are archival personnel educating their patrons with

to preventive paper preservation methods, e.g., handling, photocopying, etc.?

4. Have cooperative paper preservation projects among archives increased in number and who and which paper artifacts are involved in these projects?

5. What is the function of a regional preservation treatment center and is one needed in the Southeast?

Applications

In a conversation with a surveyed conservator, the question was asked, "What is being done in archives in the Metro Atlanta area with regard to treatment of paper collections"? The conservator's reply was, "We are using preventive measures such as maintenance holdings procedures, storage (essential environmental components: humidity and temperature controlled storage areas), and education of patrons with regard to handling and care of artifacts." Preventive measures can certainly reduce the need for costly treatments in order to preserve paper artifacts. Each archives should develop an ongoing educational program to teach patrons preventive methods of paper preservation.

There should be a greater number of paper preservation specialists, e.g., conservators/preservation officers, employed in archives to insure proper management of paper preservation policies and to insure that preservation policies/comprehensive preservation programs are in place. As those who are in charge of paper preservation policies expand their own knowledge via professional journals, workshops,

research studies and their completing surveys in the area of paper preservation, they will become aware of standard preventive preservation methods. In their role of paper preservation advocate, they will seek effective means to influence the production of acid-free paper production and effective means to influence paper preservation in their own facility. Not only is the responsibility of paper preservation with those who are conservators/preservation officers but the responsibility is also with each individual who works with paper artifacts.

Because of the expense involved in preservation treatments, cooperative preservation projects are suggested. Perhaps a regional treatment center should be built to treat paper artifacts in the Southeast.

If paper collections are to survive the inevitable, disaster plans must be placed in writing so that a designated individual could initiate action (a series of actions) in order to save/preserve paper artifacts. The same is true for preservation policies/comprehensive preservation programs. Even if preventive measures rather than treatment measures are utilized, these measures must be stated in writing to make known actions to be taken for the preservation of paper collections in archives.

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APPENDIX A

Cover Letter of Field Test Survey

to Conservators/Preservation Officers

FIELD TEST LETTER TO CONSERVATORS/PRESERVATION OFFICERS

December 1, 1992

Dear

As a sixth year student in a library media technology program at Georgia State University, I am required to field test a survey in my research study area, that of paper preservation in archives in the Metro Atlanta area. You are, therefore, respectfully requested to respond to the enclosed survey with regard to the construction of the survey. Your suggestions are needed with regard to the phrasing of the questions, question content (relevance), question bias, objectionable questions and clarity of directions.

As I am researching specifically the areas of preservation methods utilized in archives in the Metro Atlanta area and implications for conservators/preservation officers with regard to their roles in the preservation of paper artifacts, I need your input with regard to the relevance of the survey in terms of these research areas.

Please return the completed survey to me along with your comments in the enclosed stamped self-addressed envelope by DECEMBER 12, 1992.

Thank you so much for your assistance in field testing this survey. Your comments will assist me in survey analysis.

Sincerely,

Cynthia Adams

APPENDIX B

Cover Letter to Conservators/Preservation Officers

COVER LETTER TO CONSERVATORS/PRESERVATION OFFICERS

January 4, 1993

Dear

As a sixth year student enrolled in a library media technology program at Georgia State University, I am requested to conduct a survey in conjunction with my research study in the area of preservation of paper collections in archives. As a means of obtaining data in the area of paper preservation, you are respectfully requested to respond to the enclosed survey. Your answers will be confidential and will be used in such a way that your identity and institution will be protected. Your careful attention to giving accurate, complete information will be greatly appreciated.

Please return the completed survey to me in the enclosed stamped, self-addressed envelope by January 16, 1993.

Thank you so very much for your assistance in data collection. Your data will assist me in writing a research study concerning preservation methods of paper utilized by Metro Atlanta archives and implications with regard to roles for conservators/preservation officers in the area of paper preservation.

Sincerely,

Cynthia Adams

APPENDIX C

Survey Instrument

PAPER PRESERVATION SURVEY

Directions: Place a check beside each/all appropriate answer/answers. Fill in blanks where appropriate.

1. The literature indicates that archivists have been slow in responding to the issue of paper preservation. Why do you think that archivists have been slow in responding?

___ a. Other priorities; e.g., providing access
___ b. Lack of funds
___ c. Indifference
___ d. Don't know
___ e. Other _____
(Please explain)

2. Which are the most effective means by which archivists may influence acid-free paper production? (Check all that may apply.)

___ a. Meeting with paper company representatives to urge acid-free paper production
___ b. Meeting with publishers to urge the use of acid-free paper for publishing
___ c. Supporting lobbying efforts by professional archivists organizations
___ d. Other_____
(Please explain)

3. How may archivists influence paper preservation in their own facility? (Check all that may apply.)

___ a. Supporting budgeting practices which facilitate on-site paper preservation treatment
___ b. Supporting budgeting practices which facilitate paper preservation outside one's own facility
___ c. Updating one's knowledge of paper preservation through professional journals, workshops
___ d. Other_____
(Please explain)

___ NO ___ YES 4. Does your archives have a written preservation policy?

___ NO ___ YES 5. Does your archives have a written comprehensive preservation program with goals and objectives?

6. If your archives offers in-house preservation treatments, indicate which facilities are available.

____ a. Microfilming facility
____ b. Preservation facility
____ c. Bindery
____ d. Other _____
(Please explain)

7. Place a check in the appropriate column of treatment of each category of paper artifact. Which method of preservation is used in your archives for each category of paper?

Type of Paper	Box	Mylar Encapsulate	Microfilm	Photocopy	Lab Treat In-house*	Store Using Optical Disk
a. Paper copy not in a container						
b. All impermanent copies						
c. Random single impermanent sheet						
d. Frequently used and valuable paper copies						
e. Random Single damaged sheet						

*Specify mending, strengthening, cleaning, etc.

__NO __YES 8. Does your in-house preservation facility deacidify single items?
If your answer is "no," proceed to question 10.

9. Which method of deacidification is used?
_____

__NO __YES 10. Has your archives participated in mass deacidification projects? If your answer is "no," proceed to question 13.

__NO __YES 11. Which method of deacidification was used:
_____

__NO __YES 12. Was this method of deacidification satisfactory?

__NO __YES 13. Has your archives participated uncooperative paper preservation projects with other archives? If your answer is "no," proceed to question 15.

14. Please list cooperative projects in which your archives has participated:

a._____

b._____

c._____

15. Environmental Care Place a check beside "yes" or "no," indicating whether your archives has the listed environmental components.

__NO __YES a. Humidity controlled storage areas
__NO __YES b. Temperature controlled storage areas
__NO __YES c. Monitoring equipment for humidity and temperature (example: hygrothermograph)
__NO __YES d. Fire extinguishers in storage areas
__NO __YES e. Sprinklers in storage areas
__NO __YES f. Halon gas in storage areas
__NO __YES g. Carbon dioxide gas in storage areas
__NO __YES h. Disaster plan

16. Please indicate your official title

_____

17. Indicate the type of archives in which you are employed.

__Local (examples: municipal, historical society)
__Academic
__Federal
__State
__Corporate
__Special
__Religious
__Museum

COMMENTS:

THANKS SO MUCH FOR YOUR PARTICIPATION IN THIS IMPORTANT ENDEAVOR. IF YOU WOULD LIKE A COPY OF THE FINDINGS OF THIS STUDY, PLEASE INDICATE ___YES. PLEASE RETURN BY JANUARY 16, 1993.